REPORT OF THE

INVESTIGATION OF THE SUBSURFACE

STRATIGRAPHY OF SOUTHEASTERN HE'EIA PENINSULA

DEBI SCHMEDING

WINDWARD COMMUNITY COLLEGE

KANEOHE, HAWAII

INTRODUCTION

A prominent bench exists along the southeastern coastline of He'eia State Park. This bench is in a low floodplain area, opposite the He'eia fishpond, on the northwest side of He'eia stream (Fig. 1). This is an area of active erosion; the wave action coming in from Kaneohe Bay is eroding the shore line at this bench and washing away the top, cultural, layer.

PREVIOUS WORK

This area has been studied two times in the recent past. In June 1980 test corings were conducted to check for any cultural materials in a dark colored soil previously sighted in the exposed beach bank cut, and also to determine the inland extent of that layer (Fig 2). A subsurface stratigraphy of three distinct layers was found, silty loam, clayey loam, and a medium sand interbedded with red clayey silt (Yent and Oda, 1980).

In February 1982 skeletal remains were exposed on the He'ei[illegible] stream side of the peninsula, approximately one meter offshore. The remains were in an extended position in a pit 15-30 cm. below the surface. A mix fill of silty clay with cobble-sized rocks was in the pit (Ota and Kam, 1982). A second skeleton was subsequently found, approximately 30 feet south of the first, close to the shoreline.

PRESENT STUDY

On April 20 and 21, 1991, a trench was dug to further document the subsurface sedimentary deposits underlying the trench. The study was performed under the direction of Dr. Floyd McCoy, of Windward Community College, assisted by Debi Schmeding, student, and Martha Yent, archeologist with the State Park system. The trench measured 2.5m. x 1/2m., and was dug by hand, approximately one-third of the way between where the two skeleton[illegible]

were found. 9.2 meters north of skeleton 1 and 5 meters south of skeleton 2. This is roughly half-way between where cores 1 and 2 were dug during the study performed by Yent and Oda in 1980. Using the southeast corner of Building 5 as the bench mark, the southeast corner of the trench measured 56.2 meters away, sighting N 89 W (T). Digging proceeded until water began filling the bottom of the trench--approximately 110 cm. from the upper surface.

Four distinct sediment layers were found in the trench, a dark gray silty clay, a reddish-brown silty clay, a yellowish-brown sand, and a coarse sand layer.

On the north wall a section study was performed in the southwest corner. The dark gray layer was found to be 40 cm. thick, with scattered sub-angular/sub-rounded pebbles of basalt, coral, and shell, totaling approximately 10% of the sediments. There was some charcoal and contemporary debris. The dark brown layer was 25 cm. thick, with fewer pebbles, less than 5%, studded with rare bits of charcoal. The upper contact between the layers was gradational.

Below the brown layer was a layer of calcareous sand, (with approximately 20-30% noncalcareous sediments), with lenses of dark gray sandy mud. These lenses were irregular in shape, 1 x 5-10 cm. in length and discontinuous. The layer also contained some rare sub-angular/sub-rounded pebbles. The upper contact between the brown layer and the sand was sharp and irregular. This contact was approximately 91 cm. above sea level (MLLW), as measured at 1300, 21 April. At the bottom of the trench a layer of coarse sand with shells, shell fragments, and sub-angular/sub-rounded lava pebbles was found.

Approximately 1 meter from the bluff edge of the trench, where the present day shoreline lies, a dug pit was exposed, which extended from the upper contact between the gray and brown layers into the sandy layer. This pit was 25 cm. across and 15 cm. deep, and was filled with the red-brown sediments, its walls being formed from the sandy layer below. On a level with the top of the pit, at the edge of the bluff, a conch shell fragment was found. It was in the red-brown layer, just above

a cobbled layer, 20 cm. thick, which occurred on the beach surface (Fig. 3).

On the south wall the top two sediment layers were much thinner, the dark gray being 19 cm. thick and the red-brown layer 15 cm. The beach level cobbles were present here as in the north wall, measuring 20 cm.. The contact between the gray and brown layers was gradational, disappearing completely at the southeast corner. Directly below, in the sandy layer, evidence of another dug pit was found. Numerous sub-rounded/ angular cobbles were found, the sediment layer became mottled, becoming a mix of gray mud and dark gray sand. (The gray mud may have been an organic stain from the pit.) A large boulder was found in the bottom of the trench in the middle of this dug pit. The boulder was surrounded by flecks of charcoal, which were also found throughout the pit area. Lenses of dark gray mud were also found, similar to those in the north wall.

80 cm. from the bluff edge of the trench a single kukui nut was found. Just below that, in an area 31-41 cm. from the floor of the trench, in the yellowish-brown sand layer, numerous bone fragments and loose teeth were found, along with a jawbone and attached teeth determined to be canine. The bones were loose in the sediments and were removed for study. They were found to be those of a small, mature dog (A. Ziegler, per. com. 1991). (Deep parallel scratches on the bones may indicate butchering.) The jawbone was imbedded in the wall of the trench and was left undisturbed for future study (Fig. 4).

The coarse sand layer below the sandy sediments was identical and undisturbed in both the south and the north walls of the trench.

In summary, four distinct stratigraphic layers were identified, labeled A, B, C, and D. Two are believed to be cultural depositions (layers A and B), one to be a layer of mixed cultural and natural deposition (layer C), and one to be a layer of natural deposition (layer D).

CONCLUSIONS

The completed study shows that the top two stratigraphic layers are undoubtedly cultural layers. The deposition of these layers was almost certainly caused by the ancient Hawaiians, whether from their practice of clearing the accumulated silt in the nearby fishpond and then dumping that silt on the floodplain, or through the channelization of He'eia stream. It may be though, that the depositions are flood deposits.

The possibility exists to determine a date for the beginning of Hawaiian habitation at He'eia Peninsula. The lowest layer in the trench, the coarse sand storm layer, was completely undisturbed; therefore, it can be assumed to be a natural occurrence. The canine remains represent early Hawaiian activity in the area, as does the charcoal found in the pit in the south wall. If dates can be obtained from the sediments in the storm layer and from the bones and charcoal removed from the trench, it may be possible to accurately determine when settlement began at He'eia and when the fishpond itself was constructed.

REFERENCES CITED

Ota, J. and Kam, W., 1982, Human skeletal remains at He'eia State Park; Dept. Land and Natural Resources, Div. State Parks, State of Hawaii; memorandum.

Yent, M. and Ota, J., 1980, Archaeological testing at He'eia State Park; Dept. Land and Natural Resources, Div. State Parks, State of Hawaii; memorandum.

May 1, 1991

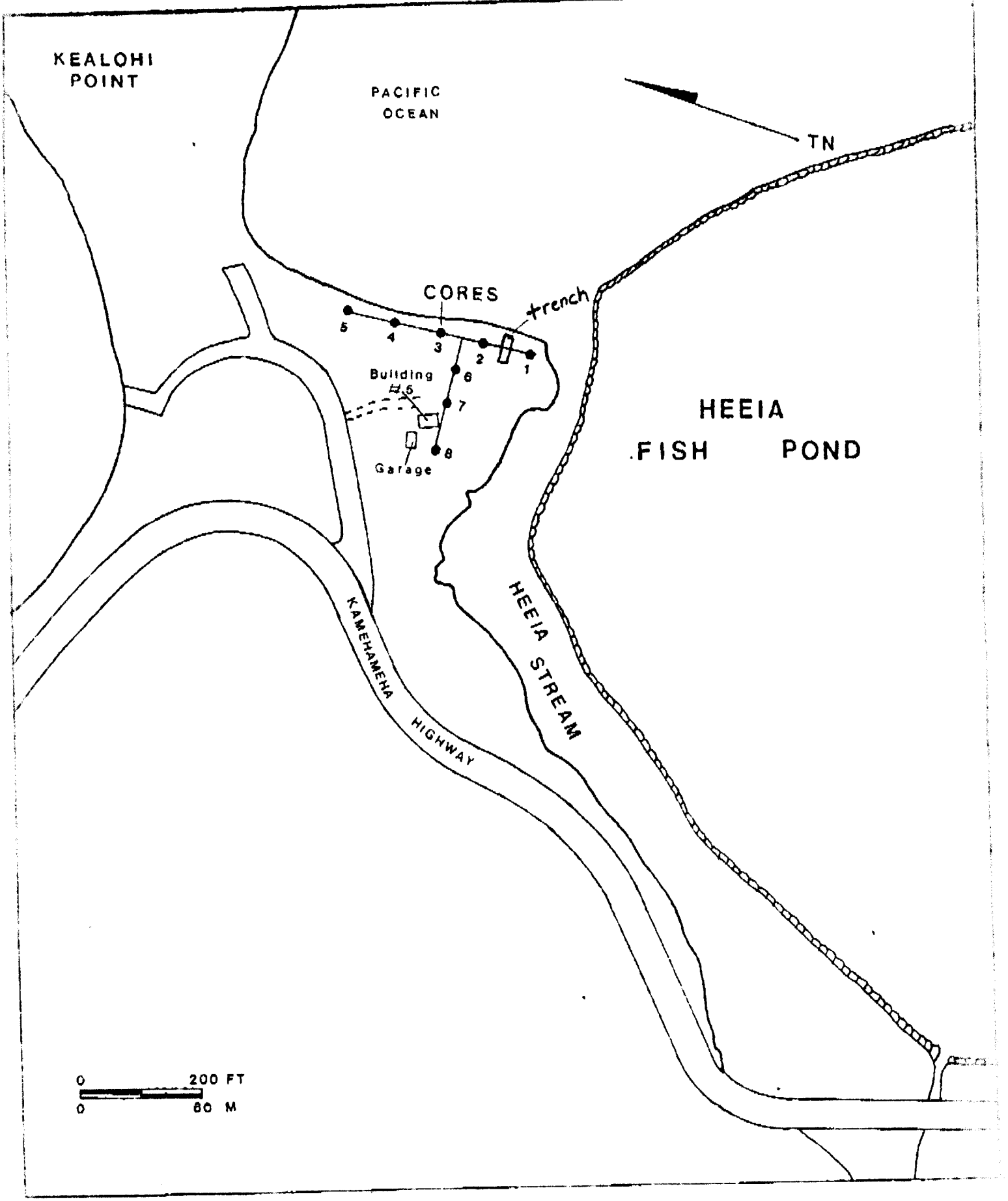
KEALOHI POINT
PACIFIC OCEAN
TN
CORES
trench
5
4
3
2
1
Building #5
6
7
8
Garage
HEEIA FISH POND
KAMEHAMEHA HIGHWAY
HEEIA STREAM
0 200 FT
0 60 M

FIG. 1

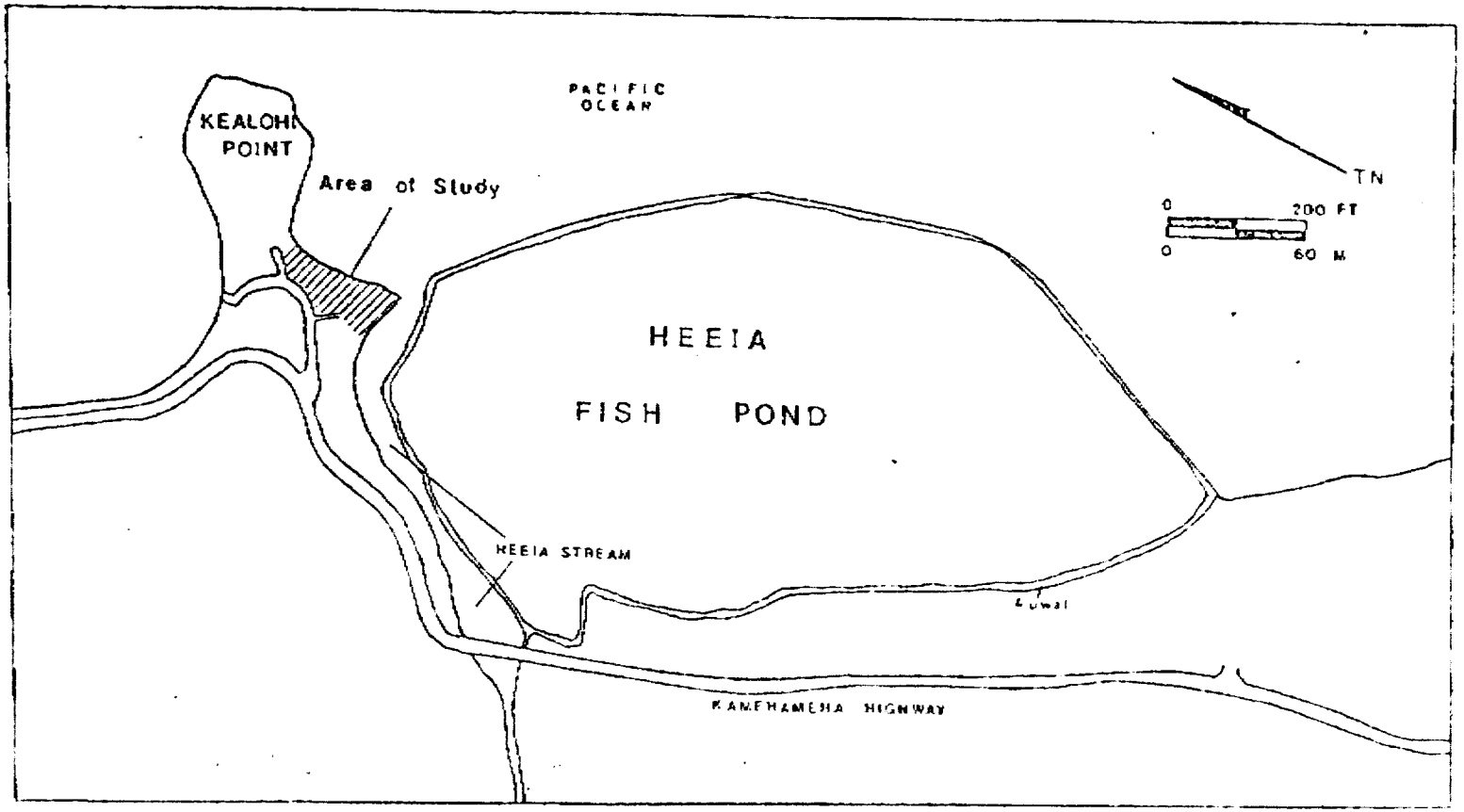

Figure showing area of study and its geographic relationship to Kealohi Point and Heeia Fish Pond

FIG. 3

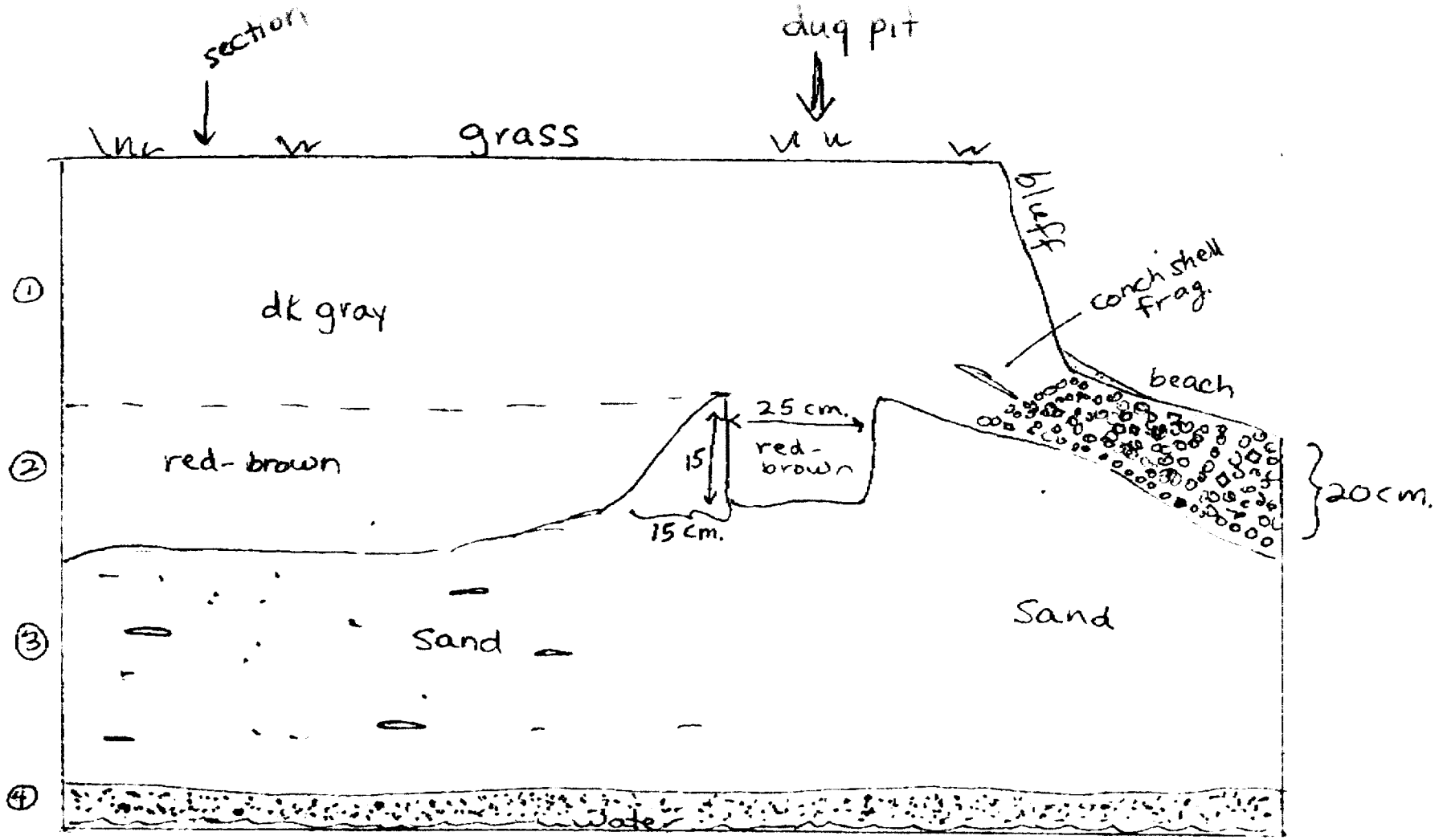
section
dug pit
grass
bluff
conch shell frag.
beach
dk gray
red-brown
25 cm.
15
red-brown
15 cm.
20 cm.
Sand
Sand
Water
1
2
3
4
NORTH WALL

FIG. 4

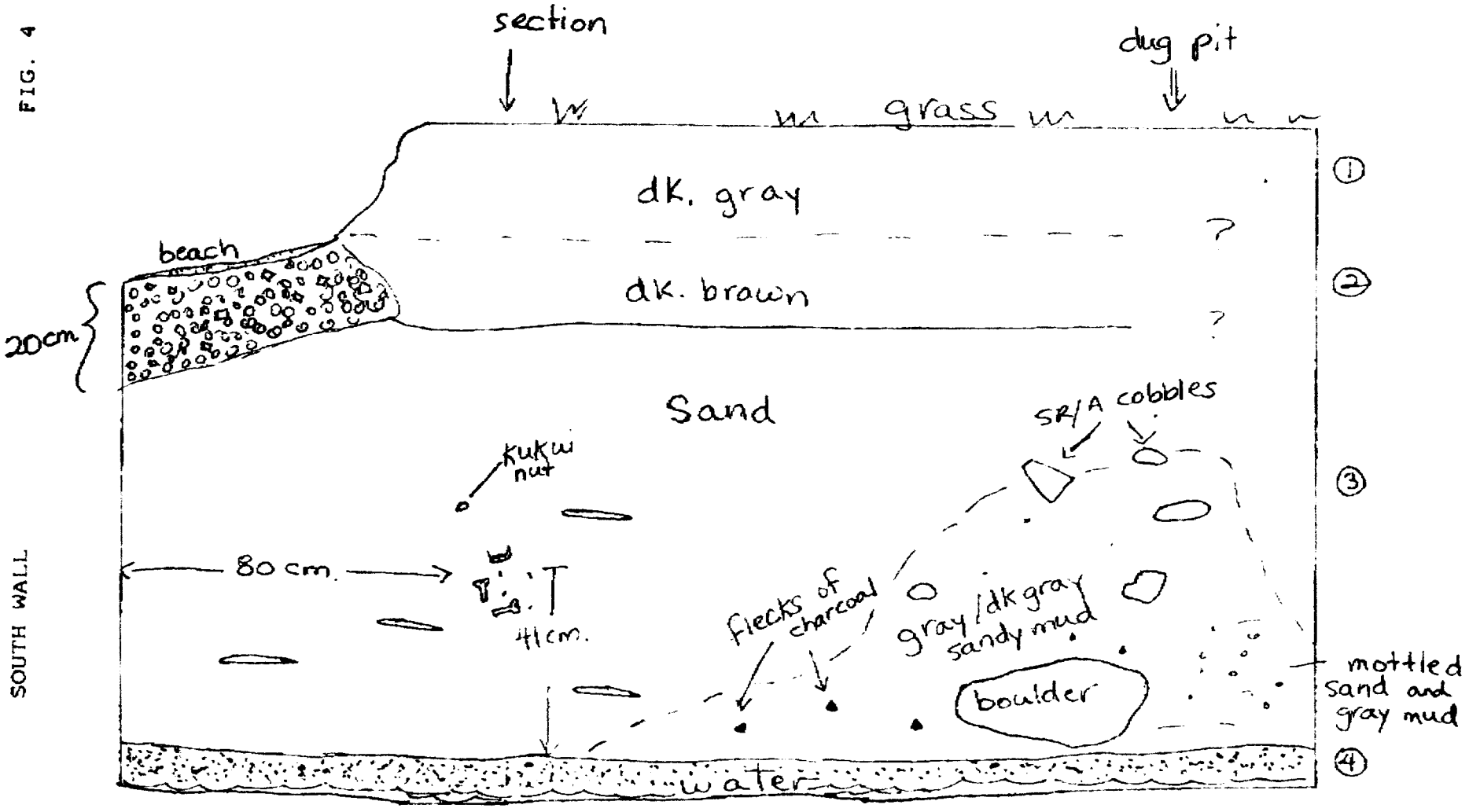
section
dug pit
grass
dk. gray
beach
dk. brown
20cm
Sand
SR/A
cobbles
kukui nut
80 cm.
41cm.
flecks of charcoal
gray/dk gray sandy mud
boulder
mottled sand and gray mud
water
SOUTH WALL
①
②
③
④

FIG. 5

MAUKA WALL (back)

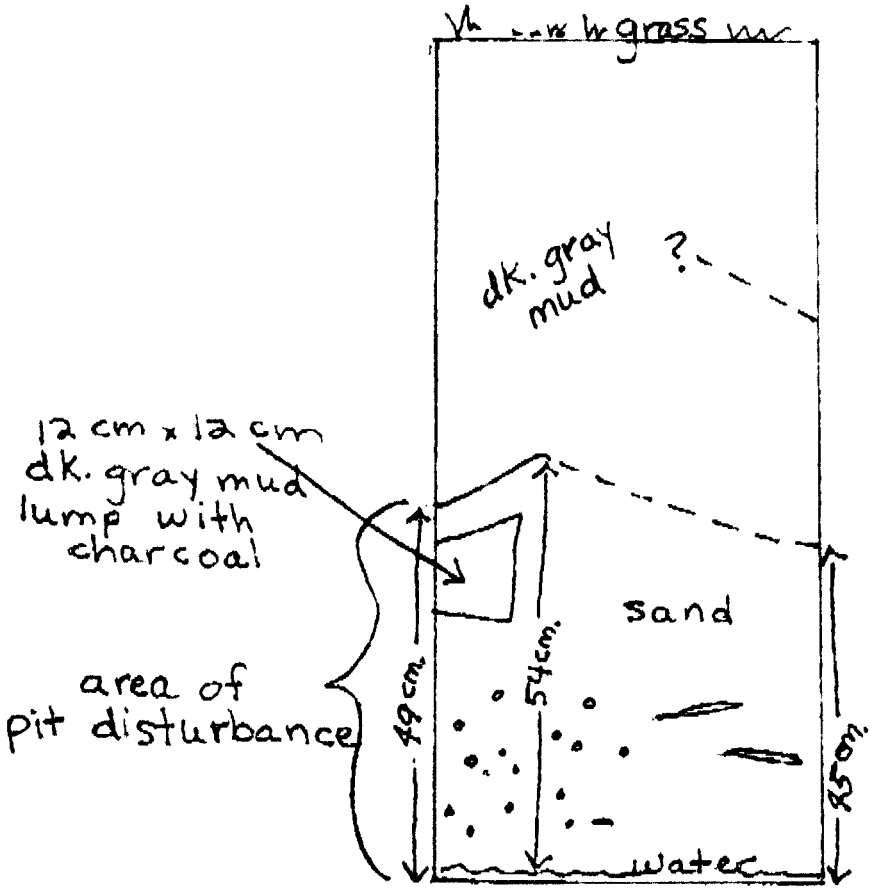

FIG. 6

MAKAI WALL

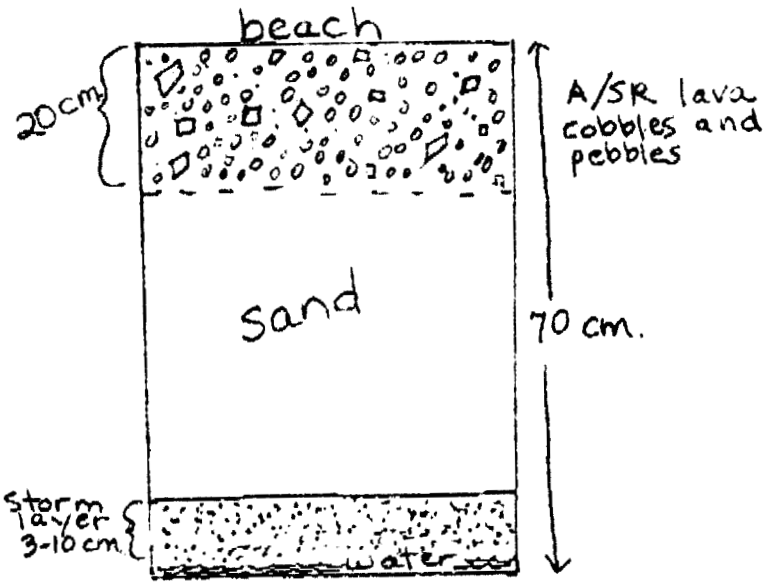

TABLE 1

Munsell Color Chart Key:

10 YR 3/1	=	very dark gray
10 YR 5/1	=	gray
10 YR 3/2	=	very dark gray/brown
10 YR 2/2	=	very dark brown
10 YR 3/3	=	dark brown
10 YR 4/3	=	dark brown or brown
5 YR 3/2	=	dark reddish-brown
5 YR 3/3	=	dark reddish-brown
10 YR 3/4	=	dark yellowish-brown
10 YR 4/4	=	dark yellowish-brown
10 YR 4/6	=	dark yellowish-brown
10 YR 5/4	=	yellowish-brown
10 YR 5/6	=	yellowish-brown

Fig 7

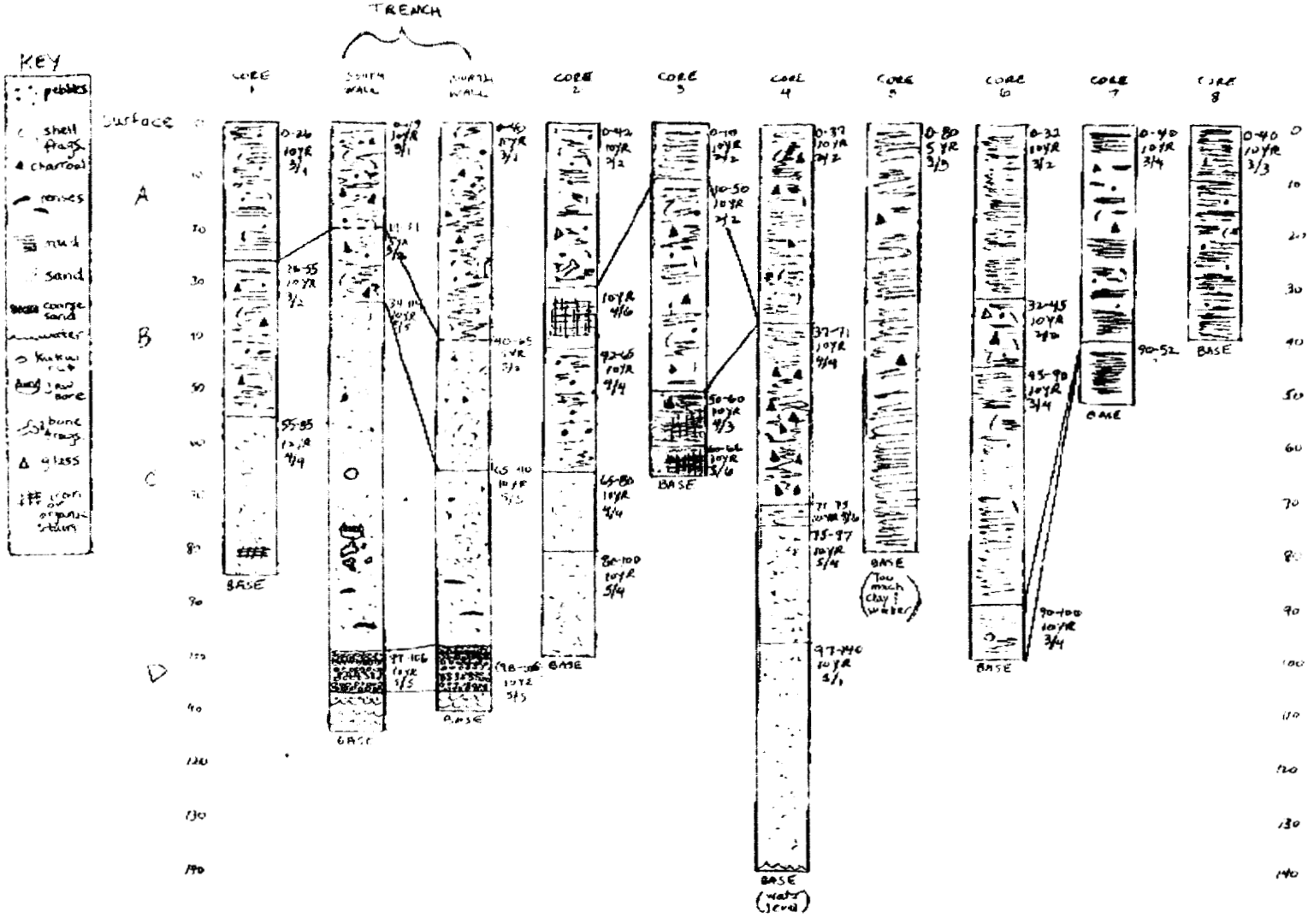
KEY
pebbles
shell
flags
charcoal
rootes
mud
sand
coarse sand
water
Kukui nut
bone awl
bone frags
glass
iron or organic stain
TRENCH
CORE 1
SOUTH WALL
NORTH WALL
CORE 2
CORE 3
CORE 4
CORE 5
CORE 6
CORE 7
CORE 8
Surface
A
B
C
D
BASE
Too much clay + water
(water level)

FIG. 8

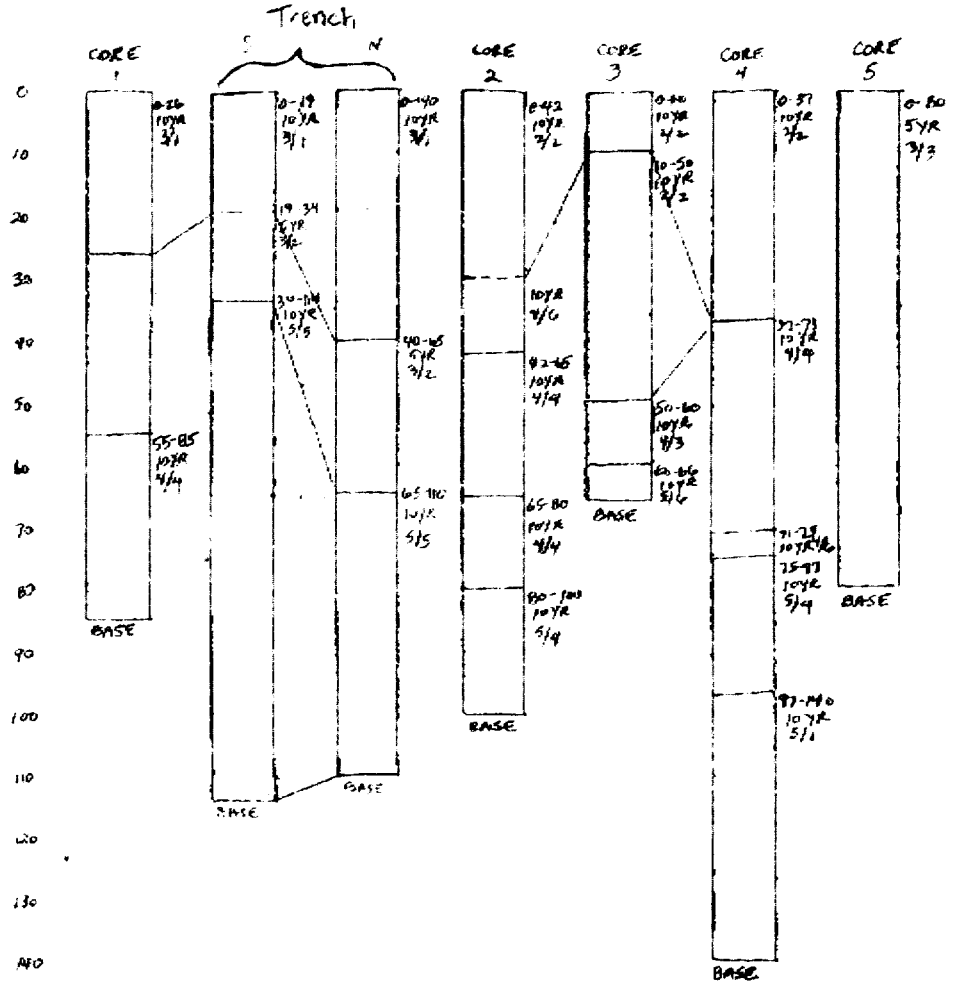
Trench
S
N
CORE 1
CORE 2
CORE 3
CORE 4
CORE 5
0
10
20
30
40
50
60
70
80
90
100
110
120
130
AFO
BASE
BASE
BASE
BASE
BASE

Fig 9

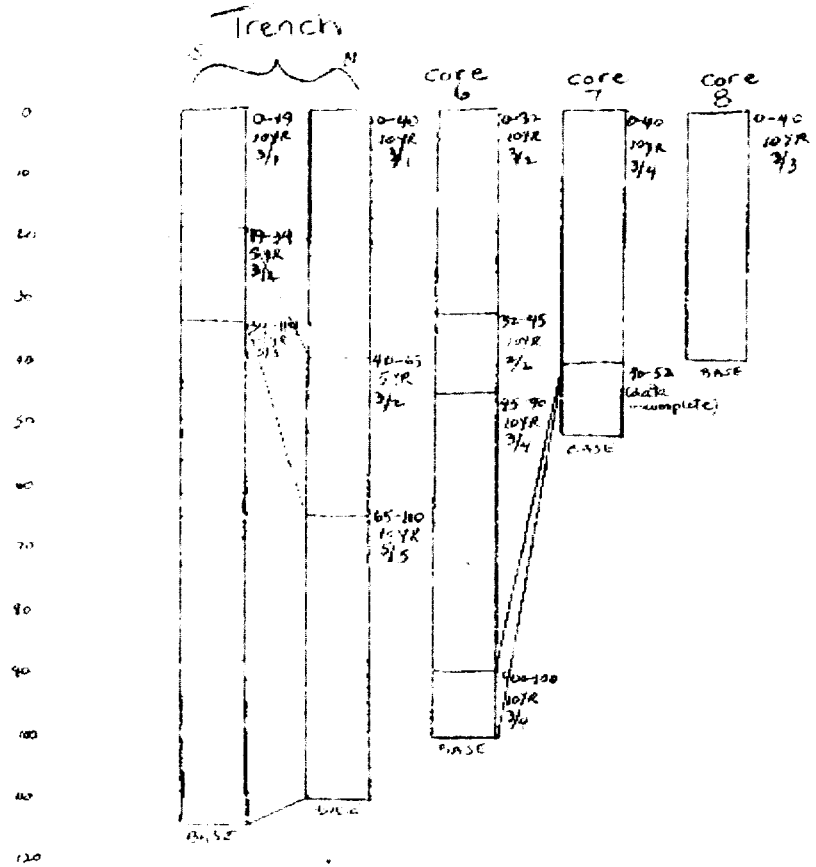
Trench
S
N
Core 6
Core 7
Core 8
0
10
20
30
40
50
60
70
80
90
100
110
120
0-19 10YR 3/1
19-39 5YR 3/2
39-65 5YR 3/2
65-100 10YR 5/5
BASE
0-40 10YR 3/1
0-32 10YR 3/2
32-45 10YR 3/2
45-90 10YR 3/4
90-100 10YR 3/4
BASE
0-40 10YR 3/4
40-52 (dark - complete)
BASE
0-40 10YR 3/3
BASE

FIG. 10

Martha Vent examining area where bones and teeth were found.

North wall of trench, dug pit visible in foreground.